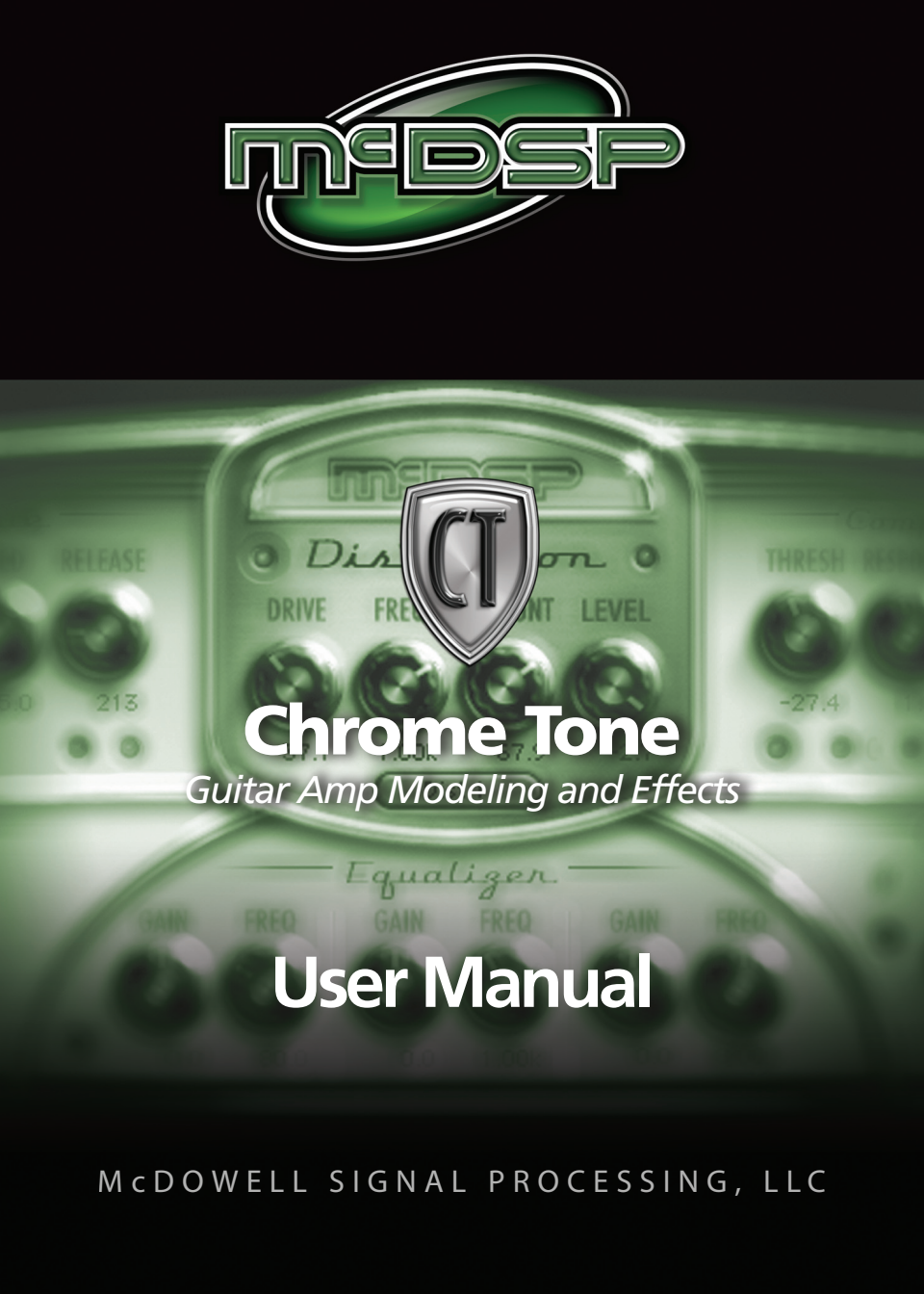
mfDSP
CT
Chrome Tone
Guitar Amp Modeling and Effects
User Manual
McDOWELL SIGNAL PROCESSING, LLC

McDSP Chrome Tone Plug-In Manual

McDSP
McDowell Signal Processing, LLC

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World Wide Web: www.mcdsp.com

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from the entire McDSP development team.

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McDSP Chrome Tone 1

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Getting Started with Chrome Tone

Each McDSP plug-in is delivered inside an installer application, and uses the Interlok copy protection software to authorize each plug-in. This section describes how to install and authorize a McDSP plug-in. General system requirements are also described.

System Requirements

McDSP HD, Native, and LE plug-ins are compatible with Pro Tools™ HD, HD Accel TDM systems, as well as Pro Tools™ LE and Pro Tools™ M-Powered host based systems. McDSP plug-ins support Mac OS 10.4.x (Tiger), 10.5.x (Leopard), Windows XP and Windows and require Pro Tools 7.x, 8.x or greater. McDSP plug-ins require an iLok USB Smart Key.

Configurations

McDSP plug-ins are available in TDM, RTAS, and AudioSuite configurations. See individual products for specific available configuration sets.

Applications

Pro Tools™ 7.x, 8.x or higher is required for TDM, LE, and M-Powered systems. Additionally, a third party software application that supports the Digidesign TDM, RTAS, or AudioSuite plug-in standard may be supported. See http://www.digidesign.com/developers/plugin_info/ for more information.

McDSP plug-ins are compatible with the entire Pro Tools™ 7 and 8 product line.

Hardware

McDSP plug-ins support any Digidesign or approved third party hardware supported in Pro Tools™ 7.x and 8.x. This includes HD, HD Accel, 003, and Mbox host based systems. All McDSP HD plug-ins, except Synthesizer One, also support the Digidesign VENUE D-SHOW systems. See http://www.digidesign.com/compato/ for more specific information.

The McDSP Mac versions are compatible with both Intel and PowerPC based computers. The McDSP Windows versions require an Intel Pentium 4 or greater processor.*

** McDSP Windows test machines are chosen to follow the Digidesign recommended systems guide, which currently is the Dell Precision™ Workstation 670 with 2.79 GHz Xeon processor. All products are guaranteed to run on that system. Older Intel processors (i.e. Pentium III and predecessors) and AMD processors are not officially supported, although some users have had limited success with newer AMD processors (i.e. Dual Opteron 1.79 GHZ, Athlon 64 2.20 GHz, and Athlon 64 XP 3700). None of McDSP Windows product line will work with Pro Tools™ 5.x. Also note the McDSP Windows product line does not support MIX, although RTAS versions will work if they exist and the rest of your system (i.e. Pro Tools™ version and processor) is compatible.*

Please visit mcdsp.com for the latest information about compatibility.

Installing the Chrome Tone Plug-In

Installation on Mac OS X

The Chrome Tone plug-in Package includes this manual, ReadMe and Release Notes, a folder of presets for the Chrome Tone plug-in, and the Chrome Tone plug-in. Two copies of the Chrome Tone Licensing Agreement are included - one in this pdf manual and a second as a separate text file. The Chrome Tone plug-in manual requires that Adobe Acrobat reader (or similar .pdf reader) is installed.

Both online and boxed version will come with a Chrome Tone installer that will automatically install the Chrome Tone plug-in and its presets on your system. The authorization of the Chrome Tone plug-in is still required after running the installer, and those steps are detailed in the following sections.

Installing the Chrome Tone plug-in and presets with the Installer:

The online version of the package has been prepared for Internet delivery, and is transmitted as a compressed file in zip format (.zip). In Mac OS X 10.4.x or 10.5.x, simply double click the *.zip file to unpack the installer. The boxed plug-in package purchased at your local dealer will be on CDROM. As with the online version, these 'physical' versions of the Chrome Tone plug-in package should be copied into a local folder on your system.

- Insert the McDSP 'HD Disk,' 'Native Disk,' or 'LE Disk' CDROM onto an available CDROM drive.
- Navigate to the Chrome Tone plug-in folder on the CDROM - the installer application is contained therein.
- Run the Chrome Tone plug-in Installer application to install (copy) the Chrome Tone plug-in, presets, and documentation to a local folder on your system. The plug-in will be placed in the 'Plug-Ins' folder, and the presets will be placed in the 'Plug-Ins Settings' folder.
- If a previous version of the Chrome Tone plug-in (or other HD, Native, or LE version) was already in the plug-ins folder, it will automatically be updated (or replaced) by the installer.

Re-installing the Chrome Tone plug-in presets manually:

In you wish to restore the factory default presets, it may be useful to know how to manually re-install only the presets.

- Go to the 'Plug-in Settings' folder:
- Root->Library->Application Support->Digidesign->Plug-in Settings
- If Pro Tools™ has not already done so for you, create a folder called 'Chrome Tone'.
- Place a copy of the folder from the Chrome Tone plug-in package called 'Presets' into the 'Chrome Tone' folder. The presets are now viewable (after restarting Pro Tools™) from the settings popup menu from the Chrome Tone plug-in.

Note it may be necessary to re-start Pro Tools™ in order for the newly added 'Presets' folder to be viewable from the Settings popup inside the Chrome Tone plug-in window toolbar.

Installation on Windows XP and Vista

The Chrome Tone plug-in Package includes this manual, ReadMe and Release Notes, a folder of presets for the Chrome Tone plug-in, and the Chrome Tone plug-in. Two copies of the Chrome Tone Licensing Agreement are included - one in this pdf manual and a second as a separate text file. The Chrome Tone manual requires that Adobe Acrobat reader (or similar .pdf reader) is installed.

Both online and boxed version will come with a Chrome Tone installer that will automatically install the Chrome Tone plug-in and its presets on your system. The authorization of the Chrome Tone plug-in is still required after running the installer, and those steps are detailed in the following sections.

Installing the Chrome Tone plug-in and presets with the Installer:

The Chrome Tone plug-in package purchased at your local dealer will be on CDROM and contain a Windows self extracting executable (.exe) similar to the online Chrome Tone plug-in package prepared for Internet delivery. Both the boxed and online versions the Chrome Tone plug-in executable file will automatically install the plug-in and its presets on your system. Double click the file to launch the installer which will install the Chrome Tone plug-in, presets, and documentation. At any time after installation, you may access the documentation from the Windows 'Start Menu' under the 'McDSP' group.

Authorization of the Chrome Tone plug-in is still required after running the installer, and those steps are detailed in the following sections. Note that after installing new versions of the PACE iLok drivers with the Chrome Tone plug-in installer, you will be prompted by the Chrome Tone plug-in installer to reboot your system. If you are not prompted by the installer, there is no need to reboot.

- Insert the McDSP 'HD Disk,' 'Native Disk,' or 'LE Disk' CDROM onto an available CDROM drive.
- Navigate to the Chrome Tone plug-in folder on the CDROM - the installer application is contained therein.
- Run the Chrome Tone plug-in Installer application to install the Chrome Tone plug-in, presets, and documentation to a local folder on your system. The plug-in will be placed in the 'Plug-Ins' folder, and the presets will be placed in the 'Plug-Ins Settings' folder.
- If a previous version of the Chrome Tone plug-in (or other HD, Native, or LE version) was already in the plug-ins folder, it will automatically be updated (or replaced) by the installer.

Re-installing the Chrome Tone plug-in presets manually:

In you wish to restore the factory default presets, it may be useful to know how to manually re-install only the presets.

- Go to the Plug-In Settings folder:
- C:\Program Files\Common Files\Digidesign\DAE\Plug-In Settings\
- If Pro Tools™ has not already done so for you, create a folder called 'Chrome Tone'.
- Place a copy of the folder from the Chrome Tone plug-in package called 'Presets' into the 'Chrome Tone' folder. The presets are now viewable (after restarting Pro Tools™) from the settings popup menu from the Chrome Tone plug-in.

Note it may be necessary to re-start Pro Tools™ in order for the newly added 'Presets' folder to be viewable from the Settings popup inside the Chrome Tone plug-in window toolbar.

Installation on VENUE D-SHOW systems

The Chrome Tone plug-in Package for VENUE D-SHOW systems includes presets for the Chrome Tone plug-in and the Chrome Tone plug-in. The Chrome Tone Licensing Agreement is displayed when installing the product on D-SHOW. The pdf manual can be obtained by running the Mac OS X or Windows XP/ Vista version of the Chrome Tone Pro Tools plug-in installer on any available computer.

Both online and boxed versions will come with a VENUE compatible installer that will automatically install the Chrome Tone plug-in and its presets on your system. The authorization of the Chrome Tone plug-in is still required after running the installer, and those steps are detailed in the following sections.

Note that all McDSP HD plug-ins, except Synthesizer One support the Digidesign VENUE D-SHOW system.

Installing the Chrome Tone plug-in and presets on VENUE with the 'HD Disk':

The boxed Chrome Tone plug-in package purchased at your local dealer will contain a CDROM titled 'HD Disk' that is specially formatted to work with your VENUE console. The VENUE installers are also available online as a compressed zip file download, however you will have to take additional steps to create your own VENUE installer CD-R, see additional instructions below before proceeding with these instructions. Both the boxed and online versions of the Chrome Tone installer are the same and will install both the plug-in and its presets on your system.

Note that after installing new versions of the PACE iLok drivers with the Chrome Tone plug-in installer, you will need to reboot your system. You will not be prompted to reboot, and if you don't you may see an error message saying "TPkd driver required, and a reboot. Please reboot or reinstall the software.' If you see this message, simply reboot the console and try again.

- Insert the McDSP 'HD Disk' CDROM onto the CD drive. Note that neither the McDSP 'Native Disk' nor the 'LE Disk' contains VENUE compatible installers.
- Ensure your system is in 'CONFIG' mode, you cannot install plug-ins in 'SHOW' mode.
- Navigate to the 'OPTIONS' page and then select the 'PLUG-INS' tab.
- You should now see the Chrome Tone plug-in available on the left hand side.
- Select the Chrome Tone plug-in and select 'INSTALL.'

- If a previous version of the Chrome Tone plug-in was already installed, it will be updated by the installer.

Important note *for FilterBank HD and CompressorBank HD on VENUE D-SHOW consoles: The first time you instantiate either of these plug-ins, a dialog box will appear asking you to choose a user interface preference. Choose the Knobs interfaces, as some of the Slider interfaces are too large for the VENUE display.*

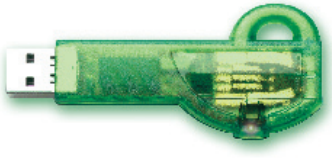
Creating a VENUE D-SHOW Installer CD-R from the online zip file:

If you do not have a boxed copy of Chrome Tone with the included 'HD Disk' CDROM, you can still obtain a copy of the VENUE compatible installers from the www.mcdsp.com website. Once you have located and downloaded the latest VENUE compatible installers from the McDSP website, you will have to take several additional steps to create a VENUE compatible Installer CD-R. For your convenience, all VENUE compatible products are located in the same downloadable zip file, so you will only have to create one CD-R to install all compatible McDSP products.

- Unzip the downloaded file and locate the folder named "TDM Plug-Ins" inside the unpacked folder.
- Using any CD-R burning application, burn this folder and its contents to an ISO format CD-R. It is recommended that you use a brand new CD-R for this, and do not rewrite an older CD-R.
- Once you have burned this folder to a CD-R, you should see it at the root level of the disk (i.e. "D:\TDM Plug-Ins"). Important: If the "TDM Plug-Ins" folder is not located at the root level of the CD-R or has been renamed, the VENUE console may not properly recognize the installer disk.
- At this point, you can follow the 'HD Disk' installation instructions above to complete the installation.

Authorizing your McDSP Plug-Ins

Authorizing with a pre-programmed iLok Smart Key



McDSP bundles such as the Emerald Pack come with a pre-programmed iLok Smart Key. Simply insert the iLok into any available USB port on your computer. The iLok's indicator light will illuminate when the iLok has a proper connection. The Plug-Ins included in the bundle require no further authorization steps. As with any iLok on your system it is recommended that your iLok be registered and synchronized with iLok.com

Authorizing with an iLok License Card

All McDSP Plug-Ins require that a valid authorization is present on your iLok USB Smart Key. McDSP Plug-ins that are purchased individually provide this authorization on a plastic License Card (about the size of a credit card), with a small punch-out iLok License Chip. After being separated from the License Card, this iLok License Chip is to be inserted into the 'key slot' of the iLok USB Smart Key in order to transfer the authorization from the License Card to the iLok USB Smart Key. Note that each License Card holds ONE Plug-In authorization. The following instructions detail this process

Important Note: The Authorization Wizard will prompt the user to register their iLok USB Smart Key at iLok.com. iLok.com is a service offered by PACE Anti-Piracy, Inc. and this step is recommended but NOT REQUIRED by McDSP to complete the authorization of the Plug-In. If you choose to register your iLok USB Smart Key at iLok.com, care must be taken to record your ilok.com account information (i.e. write down your User ID and Password in a safe place). If your iLok.com account information is lost, the iLok cannot be registered to another account and unfortunately there is nothing McDSP can do to help you. See iLok.com for more details about the benefits of using PACE's iLok.com service.

Note: Images in this section are for illustration only, the actual product and screens will be the name of the product you are authorizing.

Authorizing a McDSP Plug-In from a License Card with the Authorization Wizard:

The Authorization Wizard is used to install an authorization from a License Card to the iLok USB Smart Key. To use the Authorization Wizard for the Plug-In you purchase, perform the following steps:

- Insert your iLok USB Smart Key into an available USB port.
- On a Mac :Locate and launch the 'Authorizer' application found in the 'Authorize' folder in the Plug-In package for the McDSP Plug-In you purchased on the CD-ROM.
- On Windows XP or Vista, just launch Pro Tools™ to authorize the individual McDSP Plug-In you purchased.

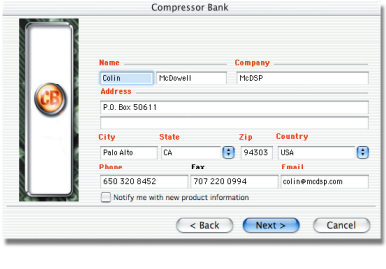
Note: When authorizing the Plug-In on Windows XP or Vista with a new iLok USB Smart Key, you must insert the iLok USB Smart Key and complete the Windows 'Found New Hardware Wizard' before attempting to authorize the Plug-In.

- Select the 'Authorize' button to be guided through the Authorization Wizard.

Compressor Bank
This Plug-In must be authorized with an iLok. An iLok License card is included in the Plug-In package. The iLok USB dongle may be purchased separately if one was not supplied with your system.
To authorize, select the "Authorize" button to be guided through the process. This version of software does not have a demonstration period.
Authorize
Quit

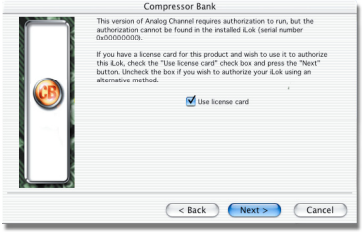
Note: Selecting the 'Quit' button at any time will not authorize the Plug-In or allow it to be used for a trial period. If 'Quit' is selected, the Plug-In will not be available in the Pro Tools™ insert menu.

- McDSP Plug-Ins require that the user personalize their copy of the Plug-In. A dialog is displayed soliciting this information.



Note that the product registration card enclosed with the Plug-In MUST ALSO be filled out as well and returned to McDSP via mail (or fax to 707-220-0994). This additional mail-in registration will entitle the user to future upgrades and advance information from McDSP.

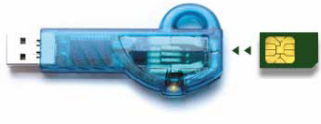
- Once the Plug-In is personalized, click the 'Next' button to continue.
- Check the 'Use License Card' box and press the 'Next' button (figure 2.3).


Compressor Bank
This version of Analog Channel requires authorization to run, but the authorization cannot be found in the installed iLok (serial number 0x00000000).
If you have a license card for this product and wish to use it to authorize this iLok, check the "Use license card" check box and press the "Next" button. Uncheck the box if you wish to authorize your iLok using an alternative method.
Use license card
< Back
Next >
Cancel

Note: Although the Authorization Wizard may appear to allow authorization by challenge/ response, that method is currently NOT SUPPORTED McDSP Plug-Ins.

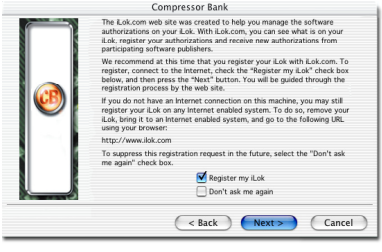
- Separate the small punch-out iLok License Chip (the removable metal and plastic tab) from the License Card by pushing the cutout up and out with your thumb. Do not force your finger downward.

- The iLok License Chip may now be inserted into the 'key slot' of the iLok USB Smart Key (figure 2.6). If the iLok USB Smart Key does not appear to be present on the system, ensure the iLok USB Smart Key is connected to a valid USB port and that the green LED is lit inside the iLok USB Smart Key. To insert the License Chip into the iLok USB Smart Key, orient the iLok USB Smart Key's USB end to the left, and the loop end to the upper right. Insert the metal chip end of the iLok License Chip (the License Chip tab should have the metal chip side facing up towards you, not down). You should be able to visually verify that the License Chip makes contact with the iLok USB Smart Key metal card reader.



- The green LED in the iLok USB Smart Key will light when it is ready to receive and transmit data.
- Upon inserting the iLok License Chip, a message will be displayed indicating the authorization was installed successfully. Click 'Ok' in the message dialog.

Authorization Successfully Installed
Authorization to run Compressor Bank has been successfully installed from your license card to your iLok (serial number 0x00000000).
OK


Compressor Bank
The iLok.com web site was created to help you manage the software authorizations on your iLok. With iLok.com, you can see what is on your iLok, register your authorizations and receive new authorizations from participating software publishers.
We recommend at this time that you register your iLok with iLok.com. To register, connect to the Internet, check the "Register my iLok" check box below, and then press the "Next" button. You will be guided through the registration process by the web site.
If you do not have an Internet connection on this machine, you may still register your iLok on any Internet enabled system. To do so, remove your iLok, bring it to an Internet enabled system, and go to the following URL using your browser:
http://www.ilok.com
To suppress this registration request in the future, select the "Don't ask me again" check box.
Register my iLok
Don't ask me again
< Back
Next >
Cancel

- Once the authorization is installed on the iLok USB Smart Key, a dialog is displayed prompting the user to register their iLok USB Smart Key at the www.ilok.com website. The iLok.com website was created to allow users to manage the software authorizations on their iLok USB Smart Key. THIS STEP IS NOT REQUIRED TO COMPLETE THE AUTHORIZATION OF MCDSP SOFTWARE. The registration of the iLok USB Smart Key to an iLok.com account can be bypassed by clearing the checkbox. The user may also choose to not be asked to register again. While iLok.com is a great resource for the iLok USB Smart Key, your iLok USB Smart Key may only be linked to one iLok.com account. That is, an individual iLok USB Smart Key can only be registered to one account at a time--but a single account can have multiple iLok USB Smart Keys. If the iLok.com account information is lost, the iLok USB Smart Key cannot be registered to another account. However, an iLok USB Smart Key may be transferred between accounts if all the authorizations have been transferred off the iLok USB Smart Key. Register the iLok USB Smart Key to an iLok.com account only when you are ready to retain all the needed iLok.com account information (User ID and Password).
- A 'Finished' dialog is displayed showing what authorization method was used.
- Click 'Finish' to exit the Authorization Wizard.

Authorizing with iLok.com

Required for demo, upgrade, and replacement authorizations only

iLok.com can be accessed from any Macintosh or PC with an Internet connection. You can do this at home, a friend's, or at the office as long as there is an internet connection to access iLok.com--note that you don't have to use your ProTools system computer! You simply use this computer to connect to iLok.com and transfer authorizations to your iLok Smart Key. The iLok Smart Key can then be moved to your ProTools system to complete authorization of your Plug-In.

You will need:

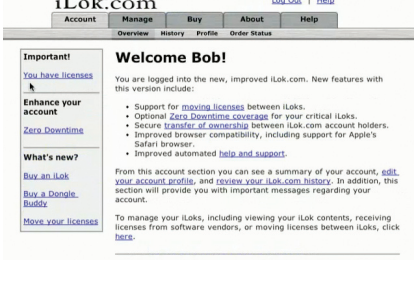
- A computer with an Internet connection. Either a Macintosh running OS 9.2 to OS 10.3 or a PC running Windows 98, ME, 2000, XP, or Vista
- An iLok USB Smart Key
- A valid iLok.com account. Visit www.iLok.com and set up a free account, if you have not already done so.

1) Download and install the required client software from iLok.com.

2) Download the desired McDSP Plug-In Installer from:
http://www.mcdsp.com/support/updating.html

3) To receive an upgrade or replacement authorization, send email your iLok.com account information to: support@mcdsp.com
To receive a demo authorization, email your iLok.com account information to: authorize@mcdsp.com

Insert your iLok Smart Key into an available USB port and ensure that the indicator light is lit. Once your demo, upgrade, or replacement authorization is available for transfer, your iLok.com account will display the notice saying "You have licenses" on the upper left. Begin by selecting that link.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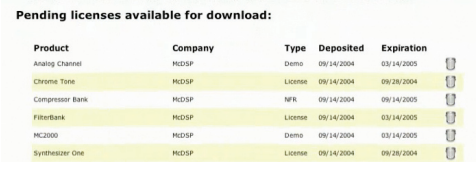
Improved automated help and support.
From this account section you can see a summary of your account, edit your account profile, and review your iLok.com history. In addition, this section will provide you with important messages regarding your account.
To manage your iLoks, including viewing your iLok contents, receiving licenses from software vendors, or moving licenses between iLoks, click here.

The next page will display the pending licenses available for download. This page will also display the name of the Plug-In, its manufacturer, the type of authorization (demo, Not For Resale, or License), the date the authorization was deposited, and the date when the authorization will no longer be available for download from the server.



Before any transfer of authorizations can take place, you must synchonize your iLok Smart Key with iLok.com. This may take a moment to process depending on your internet connection.

Insert your iLoks and synchronize:
Before downloading licenses, you must insert one or more iLoks as needed and press the "Synchronize" button. Once your iLoks are synchronized with your account, you will be able to select the licenses to download and the target iLok to receive the licenses.
Note that the synchronization process may take some time. Please press the button only once, don't remove or insert your iLoks, and don't touch your browser until the process completes. A progress page should be displayed within a few seconds of pressing the button.
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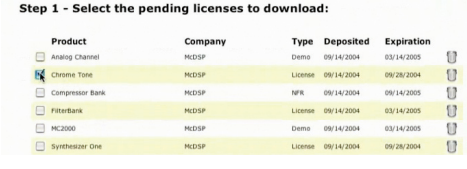
Once you have synchronized your iLok, you can select the authorization(s) you wish to transfer to your iLok.



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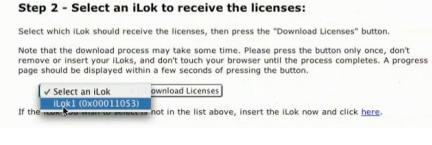
Step 2 - Select an iLok to receive the licenses:
Select which iLok should receive the licenses, then press the "Download Licenses" button.
Note that the download process may take some time. Please press the button only once, don't remove or insert your iLoks, and don't touch your browser until the process completes. A progress page should be displayed within a few seconds of pressing the button.
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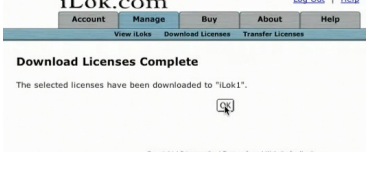
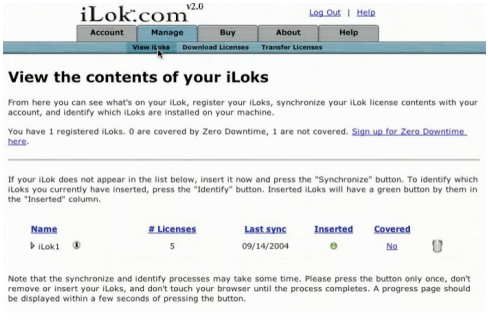
When the transfer finishes you will be asked to confirm the completition of the transaction, thereby letting you know that the transfer was successful.



If you wish to go back into your account and visually confirm the transaction for yourself, select “View iLoks” Then select the iLok you had the authorizations transferred to.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You have 1 registered iLoks. 0 are covered by Zero Downtime, 1 are not covered. Sign up for Zero Downtime here.
If your iLok does not appear in the list below, insert it now and press the "Synchronize" button. To identify which iLoks you currently have inserted, press the "Identify" button. Inserted iLoks will have a green button by them in the "Inserted" column.
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Note that the synchronize and identify processes may take some time. Please press the button only once, don't remove or insert your iLoks, and don't touch your browser until the process completes. A progress page should be displayed within a few seconds of pressing the button.

That’s it! Dont forget to logout and move the iLok Smart Key to your ProTools System if you are using another computer for Internet access. Also, you may need to install a different version of the Plug-In if you are upgrading or replacing.

Transferring Authorizations with iLok.com

You may freely transfer any authorization within your iLok.com account between any of your registered iLok Smart Keys. If you wish to transfer an authorization out of your iLok.com account to a different user, it will require additional support from PACE Anti-Piracy, Inc and may be subject to a service fee or limited by manufacturer restrictions. Check the www.ilok.com website for updates and developments regarding iLok USB Smart Keys and the Pace Interlok Copy Protection system.

Registering your McDSP Plug-In

To register your McDSP Plug-In, fill out and return the product registration card enclosed with the boxed Plug-In package by mail or fax 707-220-0994. Registering your product entitles you to future upgrades and advance information from McDSP. Each individual product must be registered (even if you have multiple copies), and the product must be registered to an individual, not an entity. If you represent a company it is your company's responsibility to notify McDSP in writing if the individual who registered the Plug-In is no longer with the company. The Company must also be able to supply matching registration information to successfully transfer ownership of the Plug-In.

Using your McDSP Plug-Ins

Starting a McDSP Plug-In:

Follow the installation, authorization, and registration instructions above, Launch Pro Tools™, and the McDSP Plug-In and its presets are ready for use. Refer to the Digidesign™ Pro Tools™ Reference Guide for details on general Plug-In operation such as automation.

Exiting a McDSP Plug-In

A McDSP Plug-In is exited by clicking on the desktop or other window in the DAE application running the Plug-In, closing the Plug-In window, or de-instantiating the Plug-In. Pro Tools™ sessions will save instantiated Plug-In configurations and their settings. Refer to the Digidesign™ Pro Tools™ Reference Guide for details on general Plug-In operation.

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McDSP Chrome Tone

Congratulations on purchasing Chrome Tone, the plug-In that brings the world of custom guitar amps, boutique outboard gear and pedal effects inside Pro Tools.

The Chrome Tone plug-In is a collection of effects that includes distortion, compression, gating, chorus, flange, EQ, wah, tremolo, spring reverb, and tape delay. These effects can all be used together in a single stacked configuration, or as independent effects. All the Chrome Tone effects can share the same dsp.

The Chrome Tone effects can respond dynamically to the incoming audio, side chain audio, or various MIDI events including MIDI note and velocity, and MIDI control data. A Dynamic section, standard on the Wah, Tremolo, and Chorus plug-Ins provides a fully controllable envelope follower to modify the effect itself (the frequency of the filters in the Wah, the gain in the Tremolo, the delay length in the Chorus). The Auto section provides periodic modulation via a low frequency oscillator (LFO). The LFO can be synced to MIDI beat clock in a variety of tempo derivatives. The LFO rate, shape, and depth can be further modulated by the state of the Dynamic section. The Stack configuration has separate Dynamic and Auto sections for each of its Wah, Tremolo, and Chorus/ Delay stages.

The Chrome Tone Amp has six distortion modes for everything from light grit to full shred. Distortion Drive, Type, and Frequency controls allow fine tuning of the distortion tone. The Amp also includes a full featured noise gate, compression and sustain circuits, low cut filters, shelving and parametric EQ, a guitar cabinet simulator (great for direct recording), and a reverb.

The Chrome Tone Wah has much more than the standard wah pedal offers. Three types of band pass (wah) filters are included, plus multiple low pass, high pass, and phasor filter configurations are available with 12, 24, and 36 dB/oct slopes. All filter configurations have selectable frequency and Q values.

The Chrome Tone Tremolo allows the mixing of the tremolo'd signal and the unaffected signal. Tremolo speed-change tremolo affects are possible using the Dynamic and Auto sections.

The Chrome Tone Chorus section has flange and two chorus modes. In the Stack configuration, there is also an analog delay line, up to 1 second long.

Feature List:

- Power and Flexibility: Four different effect configurations are available - Amp, Wah, Trem, and Chorus, plus an all in one Stack configuration. Many of the Chrome Tone configurations can share the same dsp chip. There are mono, mono to stereo, and stereo version of each configuration. See the Reference section for a complete listing of all Chrome Tone configurations and their specifications.
- Double-Precision Arithmetic: at all stages of processing.
- Chrome Tone is compatible with ProTools and other DAW applications that support TDM, RTAS, and Audiosuite plug-In formats. McDSP's Chrome Tone plug-In operates on Mac OS X and Windows XP systems.
- Supports Digidesign's™ ICON, Command 8, ProControl, and Control | 24, and Mackie's™ HUI external control surfaces.

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Quick Start Tour: Chrome Tone

Start Protools™ and Instantiate the Chrome Tone Amp configuration

- Launch Protools™ and Open a Protools™ Session.
- Verify the Display-> Mix Window Shows->Inserts View option is checked.
- In one of the inserts of a stereo master fader, select the Chrome Tone Amp configuration. Note the Chrome Tone plug-In will operate on master or regular audio tracks in mono or stereo versions. On another insert in the same track, instanciate a Chrome Tone Wah configuration.
- If the insert selection does not show Chrome Tone plug-Ins, verify that the Chrome Tone plug-In has been installed correctly.
- For more information on starting ProTools™ and working with plug-ins, see Digidesign's™ ProTools™ Reference Guide

Chrome Tone Amp Overview

The Chrome Tone Amp has six distortion modes for everything from light grit to full shred. Distortion Drive, Type, and Frequency controls allow fine tuning of the distortion tone. The Amp also includes a full featured noise gate, compression and sustain circuits, low cut filters, shelving and parametric EQ, a guitar cabinet simulator (great for direct recording), and a reverb.

- Six distortion modes for light to heavy distortion. Distortion Drive types include various gain staging (Narrow, Wide, and Low), as well as many filter types for manual wah and other special effects.
- Fully programmable Gate to remove unwanted signal. Very useful for noise reduction in the signal path, particularly when large amounts of distortion are selected. The input section includes a full featured "Pre" with more low end and several selectable "Pre" responses
- Compression and sustain circuits to augment the recorded performance. This section can also increase the overall signal level in the Distortion section.
- High pass filtering, shelving and parametric EQ.
- Multiple cabinet models and direct modes are available.
- Spring reverb.

The Controls for Chrome Tone Amp

Pre

The Pre section provides low cut filtering to remove unwanted DC and similiar noise from the signal path, while also provided coloring to the track appropriate for guitar and other applications.

The primary source of noise in most guitar signal paths is DC and 60 Hz hum. These unwanted signals are automatically removed with the low cut filter in the Pre section. The low cut frequency range extends down to 75 Hz, and a variety of Pre types are available to color the input signal (subtle bass boosting, more gentle filter roll offs, vintage pre models).

A common use of products like Chrome Tone is to re-amp the already recorded guitar track. Using the Pre 'vintage' modes, this affect can be achieved on a directly recorded guitar track.

Noise Gate

The Chrome Tone Noise Gate is designed to minimize the amount of noise heard at the output of the Chrome Tone Amp plug-In. Large amounts of gain common to most guitar amplifiers raise the noise floor of the input signal considerably. When the performance from the guitar or other input stops, this noise floor becomes very audible. The Gate section automatically reduces input gain to zero when the input signal drops below the selected threshold. The Attack, Hold, and Release controls allow the Gate to open and close in a way that does not interfere with the actual performance.

The Noise Gate controls are:

- Threshold - the level at which the gate is engaged (closed). When the input signal drops below the threshold, the gate closes and no more signal is outputted.
- Attack - the rate at which the gate opens.
- Hold - the amount of time the gate remains open once signal level rises above the Threshold.
- Release - the rate at which the gate closes.

Distortion

The Chrome Tone Amp Distortion section provides a wide range of distortion tones from light to heavy. The Distortion controls are:

- Drive - selected amount of gain (emphasis) of selected frequencies into the distortion circuit.
- Drive Type (pop-up) - Controls and shapes the frequencies that feed the distortion circuit with the following shapes:
    - Normal parametric bell
    - Wide parametric bell
    - Low Shelf
    - Band Pass Filter
    - Resonant peak Low pass filter
    - Variable Q Low pass filter
    - Resonant peak High pass filter
    - Variable Q High pass filter
    - Extremely tight Q parametric bell
- Frequency - the frequency where the Drive control gain is focused.
- Amount - the amount of distortion
- Level - the overall output level of the distortion section
- Distortion Type Popup - selects the distortion circuit type, from Light, Light II, Medium, Heavy, Shread, and Screamer.

A key element to any guitar amplification system is the sound, or 'tone' of its distortion section. For this reason, Chrome Tone offers many distortion modes. The Drive control articulates the color of the distortion, allowing the selection of the portion of the frequency spectrum incurring more distortion.

Compression

Provides a compressor and sustainer to further amplify and compress the incoming signal. The Compression controls are:

- Threshold - the level in dB at which the compression starts.
- Response - the rate at which the compressor attacks

the signal once it exceeds the Threshold value, and the rate at which the compressor releases once the signal level drops below the Threshold value. The 'C' LED indicates when compression is occurring.

- Sustain - the level to which the signal is boosted as its compressed.
- Release - the rate at which the sustain action occurs. The 'S' LED indicates when sustaining is occurring.
- Compression Ratio Popup - the ratio of input to output as determined by the compressor.

The combination of the compressor and sustainer create a gain-slew affect, common to many amplifiers when operated at high volume levels. The amplifier attempts to restrict output levels at a maximum, while boosting lower levels to the desired gain. Using the compressor and sustainer to further drive the Distortion section produces heavily distorted sounds.

The compressor and sustainer can also achieve long sustained sounds, while reducing the transient signal levels (initial string plucks for example). Instrument solos and many guitar styles benefit from these effects.

Equalizer

Allows further sonic adjustments post distortion. There are 3 bands of EQ - low shelf, parametric, and high shelf. The EQ controls are:

- Gain - +/- 12 dB in each EQ band
- Frequency - selects the frequency value for each EQ band

These EQ sections are taken straight from McDSP's award winning FilterBank plug-In. While a passive EQ mode may have been an option, the use of the active EQ in the Chrome Tone Amp gives a wider variety of sounds.

Output

Provides reverb, cabinet, and final output control. The Output section controls are:

- Phase - the polarity (phase) of the final output.

- Reverb - the amount of reverberated signal mixed with the dry signal.
- Output - the overall signal level adjustment.
- Cabinet Type - several types of cabinets, plus two direct modes.

The reverb algorithm in Chrome Tone is a combination of spring and 'room tone' reverberations. The cabinet types were created from a collection of amplifiers measured and tested during the course of Chrome Tone development. For each cabinet type (1x12, 2x12, 4x10, and 4x12), a varitey of measurement (and cabinets) were evaluated to bring a group of sounds that are very useful not for only guitar, but also for other 'amped sound' applications.

A Look at the Chrome Tone Modulation

The Chrome Tone Wah is a full featured modulated filter, configured as a Wah in default mode, and as a variety of other filters as per the 14 selectable types available. The Wah, like the Tremolo and Chorus configurations, has a Dynamics and Auto section for triggering modulation of the Wah filter (or Tremolo gain, or Chorus delay length).

The Dynamic section acts as an envelope follower with adjustable attack and decay times. A threshold determines the triggering level of the envelope follower. The amount of effect the envelope follower has on the Wah (or other selected filter) is determined by the Depth control. The amount of affect the envelope follower has on the Auto section's LFO Rate, Shape, or Depth is determined by the Mod control. Inputs to the Dynamic section are not limited to audio - side chain audio, MIDI note or velocity, and any of the 128 MIDI controllers can be used as the modulation source.

The Auto section is a configurable LFO (low frequency oscillator) used to modulate the Wah (or other selected filter) with a periodic waveform. There are two waveform shapes that can be mixed in realtime, and the second shape can be a multiple of the first. MIDI beat clock syncing is available along with a groove control.

Input

Determines the input gain of the Wah configuration. This control is also available on the Tremolo and Chorus configurations.

Dynamic

Gives complete control over an envelope follower used to modulate the Wah (or other selected filter) frequency. The Dynamic controls are:

- Threshold - the level at which the envelope follower is triggered. When the input signal rises above the threshold, the envelope 'opens' at a rate determined by the Attack control. When the input signal drops below the threshold, the envelope 'closes' at a rate determined by the Decay control.
- Depth - the amount (positive or negative) the envelope follower affects the Wah (or other filter) frequency (or Tremolo gain, or Chorus delay length).
- Attack - the rise time of the envelope follower.
- Decay - the fall time of the envelope follower.
- Mod - the amount (positive or negative) the envelope follower affects the Auto section's LFO Shape mix, Rate, or Depth amount.
- Split - separates the envelope follower signal into a left and right channel, each with the reverse polarity of the other. This allows one channel to increase the Wah filter (or other filter) frequency while the other channel decreases the frequency.
- S/R/D - enable or disable the modulation of the Auto section's LFO Shape, Rate, and Depth.
- Input - selects incoming audio, side chain audio, MIDI note, MIDI velocity, or MIDI controller (1-128) as the source from which the Dynamic envelope follower is triggered.

Auto

Gives complete control over an LFO (low frequency oscillator) used to modulate the Wah (or other selected filter) frequency. The Auto controls are:

- Shape - the mix between two selected LFO waveforms. The two shapes can be selected from popup menus on either side of the Shape control. The second shape can also be a multiple of the first shape (1x, 2x, 3x, or 4x).
- Rate - the speed of the LFO. There is a rate multiplier control underneath the Rate control for 0.1x, 1x, and 10x operation.
- Depth - the amount the Auto section affects the Wah (or other filter) frequency.
- Spread - the phase difference in the LFO for the left and right channel, up to 180 out of phase.
- Sync - enable MIDI beat clock syncing in a variety of beat intervals.
- Groove - move the LFO within the MIDI beat clock timing to allow the peaks of the LFO waveform to hit (or miss) beat boundaries.

Output

Determines the output gain of the Wah configuration. This control is also available on the Tremolo and Chorus configurations.

A Closer Look at the Chrome Tone Wah

The Chrome Tone Wah is a full featured modulated filter, configured as a Wah in default mode, and as a variety of other filters as per the 14 selectable types available. The Wah, like the Tremolo and Chorus configurations, has a Dynamic and Auto section for triggering modulation of the Wah filter (or Tremolo gain, or Chorus delay length).

Wah Section

Controls the filter type, frequency, and Q (resonance), and overall modulation range. The Wah controls are:

- Filter Type - the popup under the 'Wah' text gives 14 filter options: 3 types of band pass wah including the standard wah filter type found on many Wah pedals, 3 high pass filters (12, 24, and 36 dB/oct), 3 low pass filters (12, 24, and 36 dB/oct), 3 phasors (2, 4, and 6 stages), a wah plus low pass filter, a high pass plus wah filter, and an experimental wah filter.
- Freq - the frequency of the selected filter type. From this value the modulation of the frequency is initiated.
- Q -the resonance, or peak-emphasis, of the selected filter.
- Range - the overall modulation range from the Dynamic and Auto sections.

Using the Chrome Tone as a Wah, the wah-effect can be created in one of three ways: 1) move the frequency control itself (manual wah); 2) modulate the frequency control from a base setting with the Dynamic section (enveloped wah); or 3) modulate the frequency control from a base setting with the Auto section (auto wah). These three techniques can be extended to any of the other filter types in the Wah configuration.

The Q, or resonance, control, provides emphasis at the selected frequency, or at the currently modulated frequency. This can create filter effects commonly associated with synthesizers. The selections, bandpass, low pass, and high pass all come in 1/2/3 modes, corresponding to 12/24/36 dB per octave slopes. The intensity of the resonance increases with steeper filter slopes.

Other unique filter modes combine the wah effect with low or high pass filtering in series with it, and experimental filter types.

A Closer Look at the Chrome Tone Tremolo

The Tremolo effect is the modulation of the volume (gain) of a signal path. This effect is common in guitar and keyboards, and a variety of other instruments. The beating, or volume movements can add life to an otherwise dull performance.

The Chrome Tone Tremolo uses the same Dynamic and Auto sections found in the Wah configuration to modulate the gain in its tremolo circuit. For a detailed description of the Dynamic and Auto sections, refer to the 'Closer Look at the Chrome Tone Wah' portion of this manual.

Tremolo Section

The Chrome Tone Tremolo section has only two controls to adjust the Tremolo effect.

- Mix - the amount of dry (unaffected) signal and wet (tremolo'd) signal.
- Range - the overall modulation range from both the Dynamic and Auto sections.

While the modulation of simply volume does not seem like much of an effect at all, Chrome Tone can take the basic tremolo effect to new levels of sophistication.

Using the Dynamic section, a new signal envelope can be created (sample accurate by the way), allowing the Tremolo configuration to act as a transient design effect. Fast drum hits can be slowly ramped up, or echoed away with a beat synced MIDI input signal.

The Auto section can not only produce periodic volume modulation, but using the Spread control, new stereophonic effects can be created.

Guitar players are very used to a tremolo with a slewed rate control - one that slowly increased or decreases speed, usually over a 2x range. Chrome Tone's Tremolo configuration can realize such affects using MIDI input data and the Dynamic section's Mod control to change the LFO rate value over time. Even better, the actual audio can be used to change the LFO rate - an example of Chrome Tone as a 'performance effect'.

A Closer Look at the Chrome Tone Chorus

The Chorus effect is the modulation a set of delay lines to create a more spatial or sonically rich sound. This effect is common in guitar and keyboards, and a variety of other instruments.

The Chrome Tone Chorus uses the same Dynamic and Auto sections found in the Wah configuration to modulate the gain in its tremolo circuit.

Chorus Section

The Chrome Tone Tremolo section five controls to adjust the Chorus effect.

- Chorus Type - selects between Flange, Chorus 1, and Chorus 2 modes. In the Stack configuration, an Analog Delay mode is also available for up to 1 second of analog delay.
- Delay - the total delay line lengths used to create the delay modulated effect.
- Feedback - the amount of delayed signal feed back into the input of the delay line/s.
- Mix - the balance between the dry (un-delayed) and wet (delayed) signals.
- Range - the overall modulation range from both the Dynamic and Auto sections.

Flange, Chorus, and Vibrato Effects

The Chrome Tone Chorus configuration is capable of many types of effects, including flanging, slapback echo, doubling, vibrato, and chorus. Some of these effects are detailed below.

- Flange - select the Flange mode, and dial up a Feedback value between 20 and 70. Using a delay length between 5 and 10, a significant flange effect is heard as the Auto section is enabled, and the Depth control is set to a value between 25 and 50. Note how using a positive or negative feedback changes the color of the flange effect (most flange effects only offer one polarity of feedback - Chrome Tone gives both!).
- Chorus - using the Chorus 1 or 2 modes, along with all the parameters

as described in the 'Flange' section above, audition the effect on some tracks. Note how using the Spread control in a Mono to Stereo or Stereo configuration increases the overall stereophonic effect of the chorus. Switching from Chorus 1 and 2 with the remaining settings fixed allows the user to get acquainted with the types of sounds these modes produce.

- Vibrato - using the same settings as in the 'Flange' section above, move the Mix control to 100 so only the output of the modulated delay line is heard. Because there is no un-delayed signal in the output mix, the sound appears to only change in pitch, creating a vibrato effect.

Chorus Modulation from Dynamic Section

Often the best chorus or flange effect is one who's sound is NOT periodic - that is to say the modulation of the delay line and thickening of the sound is audible, but not a repeating pattern. Using the Dynamic section of the Chorus configuration can create great flange and chorus effects using the input audio as the modulation source. Combining this technique with a small amount of modulation from the Auto section can create very realistic voice doubling and multi-player effects.

Tips for using the Modulation

The Input control of the Dynamic section opens up a new dimension in possibilities. The use of the input audio is the most common envelope-wah setup. Chrome Tone Wah also allows a separate audio signal to be used as the input to the Dynamic section via a side chain mode. MIDI data, including note, note velocity, and controllers (1-128) can also be selected as the Dynamic section input.

An innovative way to sync the wah (or other filter) frequency modulation to MIDI beat clock is to use already synced MIDI data as the Dynamic section input. Not only is the input signal more diverse than any periodic one from the Auto section, it can be generated from any of the sophisticated MIDI editors found in digital audio workstations. Groove and swing information can also be included in the MIDI data timing itself, for even more realistic syncopated rhythmic effects.

Split mode can create great stereophonic sounds when the frequency control is setup to roughly 50 (halfway up the signal spectrum). As input is received in the Dynamic section, the filter frequency is decreased in one channel while being increased in another. Useful not only in filter modes such as wah, low pass, and high pass, but also in the various phasor modes available in Chrome Tone Wah.

Modulation of the Auto section LFO is done using the Mod control in the Dynamic section. The 'S', 'R', and 'D' LEDs enable the modulation of the LFO Shape, Rate, and Depth, at an amount determined by the Mod control. Positive values increase the Shape, Rate, and Depth controls in their respective clock wise positions (shape modulates towards shape 2, rate increases up to 2x faster, Depth increases). Negative values increase the Shape, Rate, and Depth controls in their respective counter-clock wise positions (shape modulates towards shape 1, rate decreases up to 2x slower, Depth decreases). Note the modulation of the LFO rate has no effect if the LFO is synced to MIDI beat clock.

A Closer Look at the Chrome Tone Stack

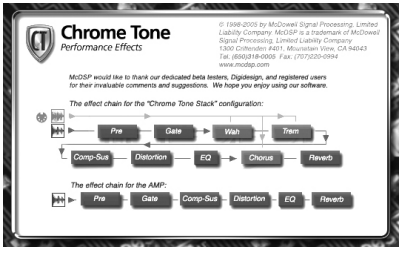
The Chrome Tone Stack configuration is a combination of the Wah, Tremolo, Amp, and Chorus configurations, grouped into pages of controls. Each control page is setup exactly as the individual configurations. Page selector and bypass controls are found in the upper left hand corner of the user interface. Clicking the Page labels displays the controls for that page. Clicking the LED under each Page label enables (or disables) that section of the Stack configuration.

The Chrome Tone Stack's Wah, Trem, and Chorus sections use the same Dynamic and Auto sections found in the individual configurations to modulate the gain in its tremolo circuit. For a detailed description of the Dynamic and Auto sections, refer to the 'Closer Look at the Chrome Tone Wah' portion of this manual.

The Chrome Tone About Box contains information on the Stack and Amp configuration flow diagrams. The About Box can be accessed by clicking the version text in the user interface of any Chrome Tone configuration.

Chrome Tone About Box

Note how the Low Cut Filter and Noise Gate from the Amp section are still the first effects in the signal chain. Removal of unwanted noise is critical before such a long series of effects is processed. The Wah and Tremolo sections are placed in front of the Compressor and Sustainer sections, as well as the Distortion and EQ sections. The Chorus and Reverb are last in the signal chain.



Chrome Tone Plug-In Reference Guide

Chrome Tone Amp Specifications

PARAMETER	SETTINGS	FUNCTION
PRE		
LOW/CUT	75 to 1000 Hz	Selects the point where low frequency signals are reduced. Filter slopes vary between -12 dB/Oct and -6 dB/Oct depending on PRE TYPE.
PRE TYPE (POPUP)	Flat, Low Bump, Vintage I, Vintage II, Vintage III	Selects the coloring of the input signal. The 'Flat' mode is the original mode. Other modes add coloring appropriate for guitar and other 'amped sound' applications.
NOISE GATE		
THRESH	-80 to 0 dB	Level at which the gate is engaged. When the input signal level drops below the THRESH value, the gate closes and no input signal is passed.
ATTACK	0 to 500 msec	Rate at which the gate opens. Green LED (on Right) is lit when gate is open.
HOLD	10 to 500 msec	Amount of time the gate remains open once signal level rises above the THRESH value.
RELEASE	10 to 1000 msec	Rate at which the gate closes. Yellow LED (on Left) is lit when gate is closed.
COMPRESSION		
THRESH	-48 to 0 dB	Level at which the compression starts. When input signal rises above the THRESH value, it is compressed at ratio selected by TYPE.
RESPONSE	200 to 2000 msec	Rate at which the compressor attacks the signal once it exceeds the THRESH value, and the rate at which the compressor releases once the signal level drops below the THRESH value. Yellow 'C' LED is lit when compression is active.
SUSTAIN	0 to 100	Amount of make-up gain applied to the signal after compression.
RELEASE	25 to 5000 msec	Rate at which the sustainer action occurs. Yellow 'S' LED is lit when sustainer is active.
TYPE (POPUP)	2:1, 4:1, 8:1 (ratio)	Ratio of input to output levels for the compressor.

PARAMETER	SETTINGS	FUNCTION
EQUALIZER (LOW SHELF, PARAMETRIC, HIGH SHELF)		
GAIN	-12 to +12 dB	Boost or cut to selected frequency region.
FREQ	40 to 400 Hz 0.40 to 4.00 kHz 4 kHz to 15 kHz	Low Shelf Parametric High Shelf
DISTORTION		
DRIVE	0 to 12 dB	Amount of gain (emphasis) of selected FREQ in distortion circuit.
DRIVE TYPE (POPUP)	Normal, Wide, Low and various Filters	Controls and shapes the frequencies that feed the distortion circuit .
FREQ	200 to 2000 Hz	Frequency where the DRIVE control gain is focused.
AMOUNT	0 to 100	Amount of distortion. Yellow LED lit when distortion circuit is active.
LEVEL	-48 to 0 dB	Overall output level of the distortion section.
TYPE (POPUP)	Light, Light II, Medium, Heavy, Shread, and Screamer	Selects the distortion circuit type, from light distortion to full shred.
OUTPUT		
REVERB	0 to 100	Amount of reverberated signal mixed with the dry signal.
CABINET TYPE (POPUP)	1x12, 2x12, 4x10, and 4x12, varied styles, and two direct modes	Several different cabinet styles with close and room microphone positions, plus direct modes with no cabinet modelling. The settings containing the indication `II' are derived from closed-back cabinets (the settings without indication are derived from open backed cabinets)
Ø (PHASE)	ON/OFF	Polarity (phase) of the final output, ON is 180° from original.
OUT	-24 to +24 dB	Overall signal level adjustment. LED Meter lit to show output level.

Chrome Tone Specifications, Modulation on Chrous, Tremolo and Wah Pages

Parameter	*Settings*	*Function*
INPUT		
GAIN	-24 to 24 dB	Determines the input gain of the effect section.
DYNAMIC SECTION		
THRESH	-40 to 0 dB	Level at which the envelope follower is triggered. When the input signal rises above the threshold, the envelope 'opens' at a rate determined by the Attack control. When the input signal drops below the threshold, the envelope 'closes' at a rate determined by the Decay control.
DEPTH	-100 to 100	Amount (positive or negative) the envelope follower affects the Wah (or other filter) frequency (or Tremolo gain, or Chorus delay length).
ATTACK	1 to 100 msec	Rise time of the envelope follower
DECAY	100 to 1000 msec	Fall time of the envelope follower
MOD	-100 to 100, routable to Auto LFO Shape (S), Rate (R), and Depth (D)	Amount (positive or negative) the envelope follower affects the Auto section's LFO Shape mix, Rate, or Depth amount.
S R D (LED)	LEDs	Enables or disables the modulation of the Auto section's LFO Shape, Rate, and Depth
SPLIT MODE	LED	Separates the envelope follower signal into a left and right channel, each with the reverse polarity of the other. This allows one channel to increase the Wah filter (or other filter) frequency while the other channel decreases the frequency
INPUT	Input audio, side chain audio, MIDI note, MIDI velocity, MIDI controller	Selects incoming audio, side chain audio, MIDI note, MIDI velocity, or MIDI controller (1-128) as the source from which the Dynamic envelope follower is triggered

Parameter	*Settings*	*Function*
AUTO SECTION		
SHAPE	-100 to 100	The mix between two selected LFO waveforms
SHAPE TYPES:	Sine, Triangle, Saw Up, Saw Down, Square	LFO waveforms
SHAPE MULTIPLE:	1x, 2x, 3x, 4x	The second shape can also be a multiple of the first shape (1x, 2x, 3x, or 4x)
RATE	0.1 to 10	Speed of the LFO
RATE MULTIPLIER:	0.1x, 1x, 10x	Rate control for 0.1x, 1x, and 10x operation
DEPTH	0 to 100	amount the Auto section affects the Wah (or other filter) frequency
SPREAD	0 to 180	Phase difference in the LFO for the left and right channel, up to 180 out of phase
SYNC	MIDI Beat clock sync enable	Enables MIDI beat clock syncing in a variety of beat intervals
<GROOVE>	Slider: -180 to +180, 0 being the un-grooved value	Moves the LFO within the MIDI beat clock timing to allow the peaks of the LFO waveform to hit (or miss) beat boundaries
OUTPUT		
OUT	-24 to +24 dB	Overall signal level adjustment. LED Meter lit to show output level.

Chrome Tone Specifications Chorus

The Chorus effect is the modulation a set of delay lines to create a more spatial or sonically rich sound. This effect is common in guitar and keyboards, and a variety of other instruments.

Parameter	*Settings*	*Function*
CHORUS TYPE	Flange, Chorus 1, Chorus 2, Analog Delay (in Stack configuration only)	Selects between Flange, Chorus 1, and Chorus 2 modes. In the Stack configuration, an Analog Delay mode is also available for up to 1 second of analog delay.
DELAY	0 to 100	The total delay line lengths used to create the delay modulated effect
FEEDBACK	-100 to 100	Amount of delayed signal feed back into the input of the delay line/s
MIX	0 to 100	Balance between the dry (un-delayed) and wet (delayed) signals
RANGE	0 to 100	Overall modulation range from both the Dynamic and Auto sections

Chrome Tone Specifications Tremolo

The Tremolo effect is the modulation of the volume (gain) of a signal path. This effect is common in guitar and keyboards, and a variety of other instruments. The beating, or volume movements can add life to an otherwise dull performance.

Parameter	*Settings*	*Function*
MIX	0 to 100	The amount of dry (unaffected) signal and wet (tremolo'd) signal
RANGE	0 to 100	Overall modulation range from both the Dynamic and Auto sections

Chrome Tone Specifications Wah

Parameter	*Settings*	*Function*
WAH TYPE	3 wahs, 3 low pass, 3 high pass, 3 phasors, wah + low pass, high pass + wah, experimental, 12/24/36 dB per oct in each set of filter types	14 filter options: 3 types of band pass wah including the standard wah filter type found on many Wah pedals, 3 high pass filters (12, 24, and 36 dB/oct), 3 low pass filters (12, 24, and 36 dB/oct), 3 phasors (2, 4, and 6 stages), a wah plus low pass filter, a high pass plus wah filter, and an experimental wah filter
FREQ	0 to 100	Frequency of the selected filter type. From this value the modulation of the frequency is initiated
Q	0 to 100	Resonance, or peak-emphasis, of the selected filter
RANGE	0 to 100	Overall modulation range from the Dynamic and Auto sections

DSP Delay

The delay incurred by any of the Chrome Tone plug-In configurations is ZERO samples. On HD systems the delay is 1 (ONE) sample. There is still a two sample delay from the TDM connection to the Chrome Tone plug-In. This is the absolute minimum number of delay samples a TDM plug-In can have. The McDSP plug-Ins are designed in this manner to provide the user with the closest analog mixing console experience possible (analog inserts such as EQ and compression do not cause a processing delay when inserted into a track).

DSP Usage

HD, and HD Accel DSP hardware

The TDM versions of the Chrome Tone plug-in configurations use a varying amount of dsp resources for each Chrome Tone configuration. The table below is a listing of these dsp usages. The DSP Allocator utility provided by Digidesign ™ (or the DSP Usage display in ProTools ™ for PT version 6.2.3 and later) may be used to display dsp resource allocation when ProTools ™ is running.

Maximum Instantiation Counts at 48 kHz

Configuration (Mono)	# Instantiations per DSP on HD systems	# Instantiations per DSP on HD Accel systems
AMP	3	6
WAH	9	18
CHORUS	7	14
TREMOLO	12	24
STACK	1	3

Maximum Instantiation Counts at 48 kHz

Configuration (Mono to Stereo)	# Instantiations per DSP on HD systems	# Instantiations per DSP on HD Accel systems
AMP	3	6
WAH	5	10
CHORUS	4	8

Configuration (Mono to Stereo)	# Instantiations per DSP on HD systems	# Instantiations per DSP on HD Accel systems
TREMOLO	7	14
STACK	1	2

Many of the Chrome Tone plug-In configurations can operate on the same dsp, depending on the configuration's dsp requirements. Below the percentages of each HD or HD Accel dsp used by a single instantiation of a Chrome Tone plug-In configuration are shown:

Maximum Instantiation Counts at 48 kHz

Configuration (Stereo)	# Instantiations per DSP on HD systems	# Instantiations per DSP on HD Accel systems
AMP	1	2
WAH	5	10
CHORUS	4	8
TREMOLO	7	14
STACK	1	2

For HD systems, Chrome Tone supports all higher sample rates (96 kHz only). However due to the dsp usage of some of the larger Chrome Tone configurations, not all configurations are available at the higher sample rates. For 96 kHz operation the dsp usage is doubled (x 2).

ProTools\|24, Nubus, and MIX DSP hardware

The processing requirements of the Chrome Tone plug-In exceed the capacity of the ProTools|24 (Classic DSP Farm) and Nubus dsp hardware. While McDSP recognizes the significant population of ProTools users who operate on these hardware cards, Chrome Tone is too large an algorithm to be supported on the ProTools|24 and Nubus hardware.

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